

Specifications

All specifications apply to all models unless noted otherwise.

Model overview

	DPO4014B ¹	DPO4034B ¹	DPO4054B ¹	DPO4102B-L, MSO4102B-L	DPO4102B, MSO4102B	DPO4104B-L, MSO4104B-L	DPO4104B, MSO4104B ¹
Analog channels	4	4	4	2	2	4	4
Bandwidth	100 MHz	350 MHz	500 MHz	1 GHz	1 GHz	1 GHz	1 GHz
Rise time	3.5 ns	1 ns	700 ps	350 ps	350 ps	350 ps	350 ps
Sample rate (1 ch)	2.5 GS/s	2.5 GS/s	2.5 GS/s	5 GS/s	5 GS/s	5 GS/s	5 GS/s
Sample rate (2 ch)	2.5 GS/s	2.5 GS/s	2.5 GS/s	2.5 GS/s	5 GS/s	5 GS/s	5 GS/s
Sample rate (4 ch)	2.5 GS/s	2.5 GS/s	2.5 GS/s	—	—	2.5 GS/s	5 GS/s
Record length (1 ch)	20M	20M	20M	5M	20M	5M	20M
Record length (2 ch)	20M	20M	20M	5M	20M	5M	20M
Record length (4 ch)	20M	20M	20M	—	—	5M	20M
Duration at highest sample rate	8 ms	8 ms	8 ms	1 ms	4 ms	1 ms	4 ms
Digital channels	MSO models add 16 digital channels to the corresponding DPO model						

Vertical system analog channels

Hardware bandwidth limits

≥350 MHz models 20 MHz or 250 MHz

100 MHz models 20 MHz

Input coupling AC, DC

Input impedance 1 MΩ ±1%, 50 Ω ±1%

Input sensitivity range

1 MΩ 1 mV/div to 10 V/div

50 Ω 1 mV/div to 1 V/div

Vertical resolution 8 bits (11 bits with Hi Res)

Maximum input voltage

1 MΩ 300 V_{RMS} CAT II with peaks ≤ ±425 V

50 Ω 5 V_{RMS} with peaks ≤ ±20 V (DF ≤ 6.25%)

DC gain accuracy ±1.5%, derated at 0.10%/°C above 30 °C

Channel-to-channel isolation Any two channels at equal vertical scale ≥100:1 at ≤100 MHz and ≥30:1 at >100 MHz up to the rated bandwidth

¹ Looking for the MSO4000B Series at 100 MHz, 350 MHz, 500 MHz or 1 GHz? You will find their replacements in the MDO4000B Series. These oscilloscopes have a built-in spectrum analyzer at no additional cost. Learn more about these products today, please visit www.tektronix.com/mdo4000.

Vertical system analog channels

Offset range	Volts/div setting	Offset range	
		1 M Ω input	50 Ω
	1 mV/div to 50 mV/div	± 1 V	± 1 V
	50.5 mV/div to 99.5 mV/div	± 0.5 V	± 0.5 V
	100 mV/div to 500 mV/div	± 10 V	± 10 V
	505 mV/div to 995 mV/div	± 5 V	± 5 V
	1 V/div to 5 V/div	± 100 V	± 5 V
	5.05 V/div to 10 V/div	± 50 V	NA

Vertical system digital channels

Input channels	16 digital (D15 to D0)
Thresholds	Per-channel thresholds
Threshold selections	TTL, CMOS, ECL, PECL, User-defined
User-defined threshold range	± 40 V
Threshold accuracy	$\pm [100 \text{ mV} + 3\% \text{ of threshold setting}]$
Maximum input voltage	$\pm 42 V_{\text{peak}}$
Input dynamic range	30 $V_{\text{p-p}} \leq 200 \text{ MHz}$ 10 $V_{\text{p-p}} > 200 \text{ MHz}$
Minimum voltage swing	400 mV
Probe loading	100 k Ω in parallel with 3 pF
Vertical resolution	1 bit

Horizontal system analog channels

Time base range	
1 GHz models	400 ps to 1000 s
$\leq 500 \text{ MHz}$ models	1 ns to 1000 s
Time-base delay time range	-10 divisions to 5000 s
Channel-to-channel deskew range	± 125 ns
Time base accuracy	± 5 ppm over any ≥ 1 ms interval

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Horizontal system digital channels

Maximum sample rate (Main)	500 MS/s (2 ns resolution)
Maximum record length (Main)	20M points (5M points on -L models)
Maximum sample rate (MagniVu)	16.5 GS/s (60.6 ps resolution)
Maximum record length (MagniVu)	10k points centered around the trigger
Minimum detectable pulse width (typical)	1 ns
Channel-to-channel skew (typical)	200 ps
Maximum input toggle rate	500 MHz (Maximum frequency sine wave that can accurately be reproduced as a logic square wave. Requires the use of a short ground extender on each channel. This is the maximum frequency at the minimum swing amplitude. Higher toggle rates can be achieved with higher amplitudes.)

Trigger system

Trigger modes	Auto, Normal, and Single								
Trigger coupling	DC, AC, HF reject (attenuates >50 kHz), LF reject (attenuates <50 kHz), noise reject (reduces sensitivity)								
Trigger holdoff range	20 ns to 8 s								
Trigger sensitivity									
Internal DC coupled	<table border="1"> <thead> <tr> <th>Trigger source</th> <th>Sensitivity</th> </tr> </thead> <tbody> <tr> <td>1 MΩ path (all models)</td> <td>For 1 mV/div to 4.98 mV/div; 0.75 div from DC to 50 MHz, increasing to 1.3 div at rated bandwidth</td> </tr> <tr> <td>50 Ω path (\leq500 MHz models)</td> <td>For \geq5 mV/div; 0.4 div from DC to 50 MHz, increasing to 1 div at rated bandwidth</td> </tr> <tr> <td>50 Ω path (1 GHz models)</td> <td>0.4 div from DC to 50 MHz, increasing to 1 div at rated bandwidth</td> </tr> </tbody> </table>	Trigger source	Sensitivity	1 M Ω path (all models)	For 1 mV/div to 4.98 mV/div; 0.75 div from DC to 50 MHz, increasing to 1.3 div at rated bandwidth	50 Ω path (\leq 500 MHz models)	For \geq 5 mV/div; 0.4 div from DC to 50 MHz, increasing to 1 div at rated bandwidth	50 Ω path (1 GHz models)	0.4 div from DC to 50 MHz, increasing to 1 div at rated bandwidth
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Trigger level ranges	
Any input channel	\pm 8 divisions from center of screen, \pm 8 divisions from 0 V when vertical LF reject trigger coupling is selected
Aux Input (external trigger)	\pm 8 V
Line	The line trigger level is fixed at about 50% of the line voltage.

Trigger frequency readout	Provides 6-digit frequency readout of triggerable events.
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Trigger types	
Edge	Positive, negative, or either slope on any channel or front-panel auxiliary input. Coupling includes DC, AC, HF reject, LF reject, and noise reject.
Sequence (B-trigger)	Trigger Delay by Time: 4 ns to 8 s. Or Trigger Delay by Events: 1 to 4,000,000 events.
Pulse Width	Trigger on width of positive or negative pulses that are >, <, =, \neq , or inside/outside a specified period of time.
Timeout	Trigger on an event which remains high, low, or either, for a specified time period (4 ns to 8 s).
Runt	Trigger on a pulse that crosses one threshold but fails to cross a second threshold before crossing the first again.

Trigger system

Logic	Trigger when any logical pattern of channels goes false or stays true for specified period of time. Any input can be used as a clock to look for the pattern on a clock edge. Pattern (AND, OR, NAND, NOR) specified for all input channels defined as High, Low, or Don't Care.
Setup and Hold	Trigger on violations of both setup time and hold time between clock and data present on any of the analog and digital input channels.
Rise/Fall Time	Trigger on pulse edge rates that are faster or slower than specified. Slope may be positive, negative, or either.
Video	Trigger on all lines, odd, even, or all fields on NTSC, PAL, and SECAM video signals.
Extended Video (optional)	Trigger on 480p/60, 576p/50, 720p/30, 720p/50, 720p/60, 875i/60, 1080i/50, 1080i/60, 1080p/24, 1080p/24sF, 1080p/25, 1080p/30, 1080p/50, 1080p/60, and custom bi-level and tri-level sync video standards.
I²C (optional)	Trigger on Start, Repeated Start, Stop, Missing ACK, Address (7 or 10 bit), Data, or Address and Data on I ² C buses up to 10 Mb/s.
SPI (optional)	Trigger on SS active, Start of Frame, MOSI, MISO, or MOSI and MISO on SPI buses up to 50.0 Mb/s.
RS-232/422/485/UART (optional)	Trigger on Tx Start Bit, Rx Start Bit, Tx End of Packet, Rx End of Packet, Tx Data, Rx Data, Tx Parity Error, and Rx Parity Error up to 10 Mb/s.
USB: Low speed (optional)	<p>Trigger on Sync Active, Start of Frame, Reset, Suspend, Resume, End of Packet, Token (Address) Packet, Data Packet, Handshake Packet, Special Packet, Error.</p> <p>Token packet trigger - Any token type, SOF, OUT, IN, SETUP; Address can be specified for Any Token, OUT, IN, and SETUP token types. Address can be further specified to trigger on \leq, $<$, $=$, $>$, \geq, \neq a particular value, or inside or outside of a range. Frame number can be specified for SOF token using binary, hex, unsigned decimal and don't care digits.</p> <p>Data packet trigger - Any data type, DATA0, DATA1; Data can be further specified to trigger on \leq, $<$, $=$, $>$, \geq, \neq a particular data value, or inside or outside of a range.</p> <p>Handshake packet trigger - Any handshake type, ACK, NAK, STALL.</p> <p>Special packet trigger - Any special type, Reserved</p> <p>Error trigger - PID Check, CRC5 or CRC16, Bit Stuffing.</p>
USB: Full speed (optional)	<p>Trigger on Sync, Reset, Suspend, Resume, End of Packet, Token (Address) Packet, Data Packet, Handshake Packet, Special Packet, Error.</p> <p>Token packet trigger - Any token type, SOF, OUT, IN, SETUP; Address can be specified for Any Token, OUT, IN, and SETUP token types. Address can be further specified to trigger on \leq, $<$, $=$, $>$, \geq, \neq a particular value, or inside or outside of a range. Frame number can be specified for SOF token using binary, hex, unsigned decimal and don't care digits.</p> <p>Data packet trigger - Any data type, DATA0, DATA1; Data can be further specified to trigger on \leq, $<$, $=$, $>$, \geq, \neq a particular data value, or inside or outside of a range.</p> <p>Handshake packet trigger - Any handshake type, ACK, NAK, STALL.</p> <p>Special packet trigger - Any special type, PRE, Reserved.</p> <p>Error trigger - PID Check, CRC5 or CRC16, Bit Stuffing.</p>

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Trigger system

USB: High speed (optional) ²	<p>Trigger on Sync, Reset, Suspend, Resume, End of Packet, Token (Address) Packet, Data Packet, Handshake Packet, Special Packet, Error.</p> <p>Token packet trigger - Any token type, SOF, OUT, IN, SETUP; Address can be specified for Any Token, OUT, IN, and SETUP token types. Address can be further specified to trigger on \leq, $<$, $=$, $>$, \geq, \neq a particular value, or inside or outside of a range. Frame number can be specified for SOF token using binary, hex, unsigned decimal and don't care digits.</p> <p>Data packet trigger - Any data type, DATA0, DATA1, DATA2, MDATA; Data can be further specified to trigger on \leq, $<$, $=$, $>$, \geq, \neq a particular data value, or inside or outside of a range.</p> <p>Handshake packet trigger - Any handshake type, ACK, NAK, STALL, NYET.</p> <p>Special packet trigger - Any special type, ERR, SPLIT, PING, Reserved. SPLIT packet components that can be specified include:</p> <ul style="list-style-type: none">• Hub Address• Start/Complete - Don't Care, Start (SSPLIT), Complete (CSPLIT)• Port Address• Start and End bits - Don't Care, Control/Bulk/Interrupt (Full-speed Device, Low-speed Device), Isochronous (Data is Middle, Data is End, Data is Start, Data is All)• Endpoint Type - Don't Care, Control, Isochronous, Bulk, Interrupt <p>Error trigger - PID Check, CRC5 or CRC16.</p>
Ethernet (optional) ³	<p>10BASE-T and 100BASE-TX: Trigger on Start Frame Delimiter, MAC Addresses, MAC Q-Tag Control Information, MAC Length/Type, IP Header, TCP Header, TCP/IPv4/MAC Client Data, End of Packet, and FCS (CRC) Error.</p> <p>100BASE-TX: Idle.</p> <p>MAC Addresses - Trigger on Source and Destination 48-bit address values.</p> <p>MAC Q-Tag Control Information - Trigger on Q-Tag 32-bit value.</p> <p>MAC Length/Type - Trigger on \leq, $<$, $=$, $>$, \geq, \neq a particular 16-bit value, or inside or outside of a range.</p> <p>IP Header - Trigger on IP Protocol 8-bit value, Source Address, Destination Address.</p> <p>TCP Header - Trigger on Source Port, Destination Port, Sequence Number, and Ack Number.</p> <p>TCP/IPv4/MAC Client Data - Trigger on \leq, $<$, $=$, $>$, \geq, \neq a particular data value, or inside or outside of a range. Selectable number of bytes to trigger on from 1-16. Byte offset options of Don't Care, 0-1499.</p>
CAN (optional)	<p>Trigger on Start of Frame, Frame Type (data, remote, error, overload), Identifier (standard or extended), Data, Identifier and Data, End of Frame, Missing ACK, or Bit Stuffing Error on CAN signals up to 1 Mb/s. Data can be further specified to trigger on \leq, $<$, $=$, $>$, \geq, or \neq a specific data value. User-adjustable sample point is set to 50% by default.</p>
LIN (optional)	<p>Trigger on Sync, Identifier, Data, Identifier and Data, Wakeup Frame, Sleep Frame, Errors such as Sync, Parity, or Checksum Errors up to 100 kb/s (by LIN definition, 20 kb/s).</p>
FlexRay (optional)	<p>Trigger on Start of Frame, Type of Frame (Normal, Payload, Null, Sync, Startup), Identifier, Cycle Count, Complete Header Field, Data, Identifier and Data, End of Frame or Errors such as Header CRC, Trailer CRC, Null Frame, Sync Frame, or Startup Frame Errors up to 100 Mb/s.</p>
MIL-STD-1553 (optional)	<p>Trigger on Sync, Word Type⁴ (Command, Status, Data), Command Word (set RT Address, T/R, Sub-address/Mode, Data Word Count/Mode Code, and Parity individually), Status Word (set RT Address, Message Error, Instrumentation, Service Request Bit, Broadcast Command Received, Busy, Subsystem Flag, Dynamic Bus Control Acceptance (DBCA), Terminal Flag, and Parity individually), Data Word (user-specified 16-bit data value), Error (Sync, Parity, Manchester, Non-contiguous data), Idle Time (minimum time selectable from 2 μs to 100 μs; maximum time selectable from 2 μs to 100 μs; trigger on $<$ minimum, $>$ maximum, inside range, outside range). RT Address can be further specified to trigger on $=$, \neq, $<$, $>$, \leq, \geq a particular value, or inside or outside of a range.</p>

² High-speed support only available on models with 1 GHz analog channel bandwidth.

³ \geq 350 MHz bandwidth models are recommended for 100BASE-TX

⁴ Trigger selection of Command Word will trigger on Command and ambiguous Command/Status words. Trigger selection of Status Word will trigger on Status and ambiguous Command/Status words.

Trigger system

I²S/LJ/RJ/TDM (optional)	Trigger on Word Select, Frame Sync, or Data. Data can be further specified to trigger on \leq , $<$, $=$, $>$, \geq , \neq a specific data value, or inside or outside of a range. Maximum data rate for I ² S/LJ/RJ is 12.5 Mb/s. Maximum data rate for TDM is 25 Mb/s.
Parallel (available on MSO models only)	Trigger on a parallel bus data value. Parallel bus can be from 1 to 16 bits (from the digital channels) plus 2 or 4 bits (from the analog channels) in size. Binary and Hex radices are supported.

Acquisition system**Acquisition Modes**

Sample	Acquire sampled values.
Peak Detect	Captures glitches as narrow as 800 ps (1 GHz models) or 1.6 ns (\leq 500 MHz models) at all sweep speeds
Averaging	From 2 to 512 waveforms included in average.
Envelope	Min-max envelope reflecting Peak Detect data over multiple acquisitions.
Hi Res	Real-time boxcar averaging reduces random noise and increases vertical resolution.
Roll	Scrolls waveforms right to left across the screen at sweep speeds slower than or equal to 40 ms/div.
FastAcq™	FastAcq optimizes the instrument for analysis of dynamic signals and capture of infrequent events, capturing >340,000 wfms/s on 1 GHz models and >270,000 wfms/s on 100 MHz - 500 MHz models.

Waveform measurements

Cursors	Waveform and Screen.
Automatic measurements (time domain)	30, of which up to eight can be displayed on-screen at any one time. Measurements include: Period, Frequency, Delay, Rise Time, Fall Time, Positive Duty Cycle, Negative Duty Cycle, Positive Pulse Width, Negative Pulse Width, Burst Width, Phase, Positive Overshoot, Negative Overshoot, Total Overshoot, Peak to Peak, Amplitude, High, Low, Max, Min, Mean, Cycle Mean, RMS, Cycle RMS, Positive Pulse Count, Negative Pulse Count, Rising Edge Count, Falling Edge Count, Area and Cycle Area.
Measurement statistics	Mean, Min, Max, Standard Deviation.
Reference levels	User-definable reference levels for automatic measurements can be specified in either percent or units.
Gating	Isolate the specific occurrence within an acquisition to take measurements on, using either the screen, or waveform cursors.
Waveform histogram	<p>A waveform histogram provides an array of data values representing the total number of hits inside of a user-defined region of the display. A waveform histogram is both a visual graph of the hit distribution as well as a numeric array of values that can be measured.</p> <p>Sources - Channel 1, Channel 2, Channel 3, Channel 4, Ref 1, Ref 2, Ref 3, Ref 4, Math</p> <p>Types - Vertical, Horizontal</p>
Waveform histogram measurements	Waveform Count, Hits in Box, Peak Hits, Median, Max, Min, Peak-to-Peak, Mean, Standard Deviation, Sigma 1, Sigma 2, Sigma 3

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Waveform math

Arithmetic	Add, subtract, multiply, and divide waveforms.
Math functions	Integrate, Differentiate, FFT.
FFT	Spectral magnitude. Set FFT Vertical Scale to Linear RMS or dBV RMS, and FFT Window to Rectangular, Hamming, Hanning, or Blackman-Harris.
Advanced math	Define extensive algebraic expressions including waveforms, reference waveforms, math functions (FFT, Intg, Diff, Log, Exp, Sqrt, Abs, Sine, Cosine, Tangent, Rad, Deg), scalars, up to two user-adjustable variables and results of parametric measurements (Period, Freq, Delay, Rise, Fall, PosWidth, NegWidth, BurstWidth, Phase, PosDutyCycle, NegDutyCycle, PosOverShoot, NegOverShoot, PeakPeak, Amplitude, RMS, CycleRMS, High, Low, Max, Min, Mean, CycleMean, Area, CycleArea, and trend plots), e.g., $(\text{Intg}(\text{Ch1} - \text{Mean}(\text{Ch1})) \times 1.414 \times \text{VAR1})$.

Act on Event

Events	None, when a trigger occurs, or when a defined number of acquisitions complete (1 to 1,000,000)
Actions	Stop acquisition, save waveform to file, save screen image, print, AUX OUT Pulse, remote interface SRQ, e-mail notification, and visual notification.
Repeat	Repeat the act on event process (1 to 1,000,000 and infinity)

Video Picture Mode (optional)

Sources	Channel 1, Channel 2, Channel 3, Channel 4
Video standards	NTSC, PAL
Contrast and brightness	Manual and automatic
Field selection	Odd, Even, Interlaced
Picture location on screen	Selectable X and Y location, width and height adjustment, start line and pixel and line-to-line offset control.

Power measurements (optional)

Power Quality Measurements	V_{RMS} , $V_{\text{Crest Factor}}$, Frequency, I_{RMS} , $I_{\text{Crest Factor}}$, True Power, Apparent Power, Reactive Power, Power Factor, Phase Angle.
Switching loss measurements	
Power loss	T_{on} , T_{off} , Conduction, Total.
Energy loss	T_{on} , T_{off} , Conduction, Total.
Harmonics	THD-F, THD-R, RMS measurements. Graphical and table displays of harmonics. Test to IEC61000-3-2 Class A and MIL-STD-1399, Section 300A.
Ripple measurements	V_{Ripple} and I_{Ripple} .
Modulation Analysis	Graphical display of +Pulse Width, -Pulse Width, Period, Frequency, +Duty Cycle, and -Duty Cycle modulation types.
Safe operating area	Graphical display and mask testing of switching device safe operating area measurements.
dV/dt and dI/dt measurements	Cursor measurements of slew rate.

Limit/Mask testing (optional)

Included standard masks ⁵	ITU-T, ANSI T1.102, USB
Test source	Limit test: Any Ch1 - Ch4 or any R1 - R4 Mask test: Any Ch1 - Ch4
Mask creation	Limit test vertical tolerance from 0 to 1 division in 1 m division increments; Limit test horizontal tolerance from 0 to 500 m division in 1 m division increments Load standard mask from internal memory Load custom mask from text file with up to 8 segments
Mask scaling	Lock to Source ON (mask automatically re-scales with source-channel settings changes) Lock to Source OFF (mask does not re-scale with source-channel settings changes)
Test criteria run until	Minimum number of waveforms (from 1 to 1,000,000; Infinity) Minimum elapsed time (from 1 second to 48 hours; Infinity)
Violation threshold	From 1 to 1,000,000
Actions on test failure	Stop acquisition, save screen image to file, save waveform to file, print screen image, trigger out pulse, set remote interface SRQ
Actions on test complete	Trigger out pulse, set remote interface SRQ
Results display	Test status, total waveforms, number of violations, violation rate, total tests, failed tests, test failure rate, elapsed time, total hits for each mask segment

Software

OpenChoice® Desktop	Enables fast and easy communication between a Windows PC and your oscilloscope using USB or LAN. Transfer and save settings, waveforms, measurements, and screen images. Included Word and Excel toolbars automate the transfer of acquisition data and screen images from the oscilloscope into Word and Excel for quick reporting or further analysis.
IVI driver	Provides a standard instrument programming interface for common applications such as LabVIEW, LabWindows/CVI, Microsoft .NET, and MATLAB.
e*Scope® Web-based remote control	Enables control of the oscilloscope over a network connection through a standard web browser. Simply enter the IP address or network name of the oscilloscope and a web page will be served to the browser. Transfer and save settings, waveforms, measurements, and screen images or make live control changes to settings on the oscilloscope directly from the web browser.
LXI Class C Web interface	Connect to the oscilloscope through a standard Web browser by simply entering the oscilloscope's IP address or network name in the address bar of the browser. The Web interface enables viewing of instrument status and configuration, status and modification of network settings, and instrument control through the e*Scope Web-based remote control. All Web interaction conforms to LXI Class C specification, version 1.3.

⁵ ≥350 MHz bandwidth models are recommended for mask testing on telecomm standards >55 Mb/s. 1 GHz bandwidth models are recommended for mask testing on high-speed (HS) USB.

Datasheet

Display system

Display type	10.4 in. (264 mm) liquid-crystal TFT color display
Display resolution	1,024 horizontal × 768 vertical pixels (XGA)
Interpolation	Sin(x)/x
Waveform styles	Vectors, Dots, Variable Persistence, Infinite Persistence.
Graticules	Full, Grid, Cross Hair, Frame, IRE and mV.
Format	YT and simultaneous XY/YT
Maximum waveform capture rate	>340,000 wfms/s in FastAcq acquisition mode on 1 GHz models >270,000 wfms/s in FastAcq acquisition mode on 100 MHz - 500 MHz models >50,000 wfms/s in DPO acquisition mode on all models.

Input/output ports

USB 2.0 high-speed host port	Supports USB mass storage devices and keyboard. Two ports on front and two ports on rear of instrument.
USB 2.0 device port	Rear-panel connector allows for communication/control of oscilloscope through USBTMC or GPIB (with a TEK-USB-488), and direct printing to all PictBridge-compatible printers.
Printing	Print to network printer, PictBridge printer, or to a printer that supports e-mail printing. Note: This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. (http://www.openssl.org/)
LAN port	RJ-45 connector, supports 10/100/1000 Mb/s
Video out port	DB-15 female connector, connect to show the oscilloscope display on an external monitor or projector. XGA resolution.
Auxiliary input	Front-panel BNC connector. Input Impedance 1 M Ω . Max input 300 V _{RMS} CAT II with peaks $\leq \pm 425$ V.
Probe compensator output voltage and frequency	Front-panel pins Amplitude 0 to 2.5 V Frequency 1 kHz
Auxiliary out	Rear-panel BNC connector V_{OUT} (Hi): ≥ 2.5 V open circuit, ≥ 1.0 V 50 Ω to ground V_{OUT} (Lo): ≤ 0.7 V into a load of ≤ 4 mA; ≤ 0.25 V 50 Ω to ground Output can be configured to provide a pulse out signal when the oscilloscope triggers, the internal oscilloscope reference clock out, or an event out for limit/mask testing.
External reference input	Time-base system can phase lock to an external 10 MHz reference (10 MHz $\pm 1\%$)
Kensington-style lock	Rear-panel security slot connects to standard Kensington-style lock.
VESA mount	Standard (MIS-D 100) 100 mm VESA mounting points on rear of instrument.

LAN eXtensions for Instrumentation (LXI)

Class	LXI Class C
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Version	V1.3
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Power source

Power source voltage	100 to 240 V \pm 10%
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Power source frequency	50 to 60 Hz \pm 10% at 100 to 240 V \pm 10% 400 Hz \pm 10% at 115 V \pm 13%
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Power consumption	225 W maximum
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Physical characteristics

Dimensions		
	mm	in.
Height	229	9.0
Width	439	17.3
Depth	147	5.8

Weight		
	kg	lb.
Net	5	11
Shipping	10.7	23.6

Rackmount configuration	5U
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Cooling clearance	2 in. (51 mm) required on left side and rear of instrument
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EMC, environment, and safety**Temperature**

Operating	0 °C to +50 °C (+32 °F to 122 °F)
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Nonoperating	-20 °C to +60 °C (-4 °F to 140 °F)
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Humidity

Operating	High: 40 °C to 50 °C, 10% to 60% relative humidity, Low: 0 °C to 40 °C, 10% to 90% relative humidity
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Nonoperating	High: 40 °C to 60 °C, 5% to 60% relative humidity, Low: 0 °C to 40 °C, 5% to 90% relative humidity
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Altitude

Operating	3,000 meters (9,843 feet)
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Nonoperating	9,144 meters (30,000 feet)
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Regulatory

Electromagnetic compatibility	EC Council Directive 2004/108/EC
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Safety	UL61010-1:2004, CAN/CSA-C22.2 No. 61010.1: 2004, Low Voltage Directive 2006/95/EC and EN61010-1:2001, IEC 61010-1:2001, ANSI 61010-1-2004, ISA 82.02.01
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